greater and more decided evidences of disease within the cranium; and these changes to be still more marked, when, as is probably the case in our epidemic, the poison is either concentrated, or there exists a prevailing susceptibility to its influence. I have not attempted to discuss the subject of contagion, as connected with this disease, because the facts are too few and observation has been too incomplete to authorize any decided opinion. In seeking for the cause of this determination to the brain would the conjecture be hazardous that refers it, in part, to the mental tension engendered by the gigantic intestine contest that has afflicted our country for the past four years? May not the storm of political strife, the feverish speculation, and thirst for gain, the anxiety for the absent, the sorrow for the dead, the almost delirious excitement and passion, that have ruled the minds of men during these turbulent years of suffering and bloodshed; may not these emotions have contributed to invite the action of the morbid cause to that organ, which is itself the seat and instrument of all our thoughts and feelings?

In conclusion, as appropriate to the discussion and irreconcilable opinions that have been, and are being recorded, concerning this disease, I would say, in the language of Sir Henry Holland: "Hasty and imprudent belief may here become a cause of serious mischief, the wider in its spread as the minds most prone to this credulity are those most ready also to publish to the world their premature conclusions, and thus mislead the many who found their own practice upon faith in others, or *who seek after novelty as if this were in itself an incontestable good.*"

FREDERICK CITY, MARYLAND, JULY 20, 1865.

ART. VIII.—*On the Treatment of Gunshot Injuries of the Head.* By JOHN ASHHURST, Jr., M. D., one of the Surgeons to the Episcopal Hospital, and late Executive Officer to the Cuyler U. S. A. Hospital.

IN the number of the *American Journal of the Medical Sciences* for July, 1864, I reported a number of cases of injuries of the head, occurring in civil life, in which operative treatment had been avoided, and from which I ventured to infer that the employment of the trephine was in most instances of but questionable utility.

The cases which I have included in the present paper are of injuries received by gunshot wound, and are therefore of the class in which trephining is generally represented as especially indicated. They came under my observation in the Cuyler U. S. A. Hospital, and it is from the notes of the medical officers of that hospital that my reports are compiled. In two of the five cases recovery ensued, a fair proportion when the severity

of the injuries is considered; while in those which terminated fatally the *post-mortem* examinations showed, I think, most conclusively, that no more favourable result could have been anticipated from operative interference.

The first three cases are of gunshot fracture, and the others of gunshot contusion of the skull.

CASE I. *Gunshot fracture of frontal bone; ball lodged; death from cerebral abscess.*—Simon S. B. Sholl, private, Co. E, 82d Pa. Vols., aged 21 years, and by occupation a farmer, entered the Cuyler Hospital on May 31, 1864, suffering from a wound of the head received in the battle of Spottsylvania. When first wounded, he had fallen stunned, and had remained insensible for some little time. When seen by Dr. John M. Leedom, in whose ward the patient was placed, and who has furnished the notes of this case, he appeared much depressed and exhausted, becoming towards evening feverish, and complaining of pain in the top and back of the head. He was found to have been wounded in the forehead, the ball entering over the left orbit, and having been apparently removed by a counter-opening from a corresponding point on the right side. It appeared probable, from a careful examination of the parts, that the ball had perforated the frontal sinus on both sides, making its exit without inflicting injury on the cerebral mass itself.

For two weeks or more the only prominent symptoms were headache, obstinate constipation, and vomiting; these were afterwards succeeded by insomnia and great jactitation. The treatment consisted of the administration of a mercurial purge at the beginning, and the use afterwards of diaphoretics and the topical application of cold. On the morning of June 18, the patient was found in an almost completely comatose condition, a state of things which was as unexpected as it was alarming. The left pupil was contracted, while that of the right side was widely dilated, and both insensible to light. The patient could with difficulty be roused sufficiently to protrude the tongue when desired to do so, and immediately relapsed into his previous unconscious condition. He remained in this state until his death, which ensued about $1\frac{1}{2}$ P.M. the same day.

An autopsy was made forty-five hours after death, with the following results: Rigor mortis unusually well marked. The only external lesions noticed were the wounds of entrance and exit in the forehead, before described. The calvaria being removed, the membranes were found to present a fine arterial injection, the venous trunks also being considerably engorged. The brain itself presented a moderate degree of interstitial congestion.

A large abscess was found in the lower part of the anterior lobe of the right hemisphere, extending backward, and opening into the lateral ventricle on the same side. It was found that the ball had produced a fracture of the frontal bone a little to the left of, and involving the median line, making an opening three-quarters of an inch long by half an inch wide; the ball had been split into two portions, one finding its way beneath the integuments of the forehead, and having been extracted on the right side, as before described, and the other entering the cavity of the cranium, splintering the *crista galli*, and lodging immediately over the ethmoidal cells, the roof of which it had partially destroyed. Several spiculæ of bone were found penetrating the membranes, and a small clot surrounded by old coagulable lymph showed at once the original seat of injury to the brain, and the point at which suppuration had begun. The abscess was of the

diffused variety, with shaggy walls, and contained about three ounces of greenish flocculent pus, mingled with broken-down brain-substance. The left lateral ventricle contained a small amount of serum, but was not the seat of any morbid change. No abnormal appearances were observed in the thoracic viscera, while those of the abdomen were not examined.

A point of interest in this case was the rudimentary state of the frontal sinus, an anatomical variation from the customary condition to which may probably be attributed the fatal result, since the portion of ball which in this case penetrated the cranium would, in an ordinary skull, have lodged in the frontal sinus, and might have become encysted, or could possibly have been removed without injury to the internal table or true cranial envelope.

CASE II. *Compound depressed fracture of parietal bone, from a gunshot wound; recovery.*—[The notes of this case were furnished by Dr. W. R. Dunton and Dr. R. N. Downs, who successively had charge of the patient.] Josiah Reed, private, Co. F, 148th N. Y. Vols., was admitted to Cuyler Hospital, June 13, 1864, having been wounded ten days previously by a musket-ball at the battle of Cold Harbour. He was found to have sustained a compound fracture of the cranium on the right side, involving the superior posterior angle of the right parietal bone, with considerable depression of the fragment. He stated that when wounded he became immediately paralyzed, and so continued for about five hours, when the paralysis gradually passed off. When first seen in this hospital, he complained of headache, without stupor or delirium, and was able to answer questions correctly, though slowly. He had a sensation of weight and tingling in the foot and leg of the left side, and the motions of this limb were somewhat impaired. The left arm was less affected than its corresponding lower extremity. The tongue was slightly drawn towards the left side; the pupils natural, and sensitive to light. There was slight nausea, but never absolute vomiting; the pulse about sixty beats to the minute, and full, but not strong.

This condition lasted without much change (except a slight diminution of paralysis) until the beginning of July, 1864, when an increase of dulness and headache, and a decided icteroid tinge over the whole body, rendered the prognosis as to the ultimate result more serious than it had previously been considered.

A careful examination of the local injury now showed that a considerable portion of bone was detached, and lying within the wound. The soft parts were therefore cautiously divided upon a grooved director, and all sequestra that could be reached removed. The largest fragment was fully one inch in length, and half as broad, and involved the whole thickness of the bone. A considerable amount of fetid pus now flowed from the wound, and the dura mater, covered with healthy granulations, could be seen at the bottom of the cavity plainly transmitting the pulsations of the brain. The patient was ordered to be kept in bed, with the head elevated, and cold fomentations to be constantly applied. Low diet and occasional mercurial and saline purges constituted the rest of the treatment. From this time he recovered without a bad symptom, the wound being entirely healed on Sept. 30, with the scalp puckered into and nearly filling the gap in the skull. The patient might now be considered as entirely well.

CASE III. *Gunshot depressed fracture of temporal bone, proving fatal on fifteenth day.*—Montellion Smith, private, Co H, 5th Vt. Vols., 39 years of age, was admitted to Cuyler Hospital, Oct 24, 1864, suffering apparently from a flesh wound merely of the scalp. He stated that he had been wounded five days previously, by a conical ball, at the battle of Cedar Creek, being stunned, and having remained unconscious for some little time. The ball had been extracted on the field. His general condition, when first seen in this hospital by Dr. C. R. Prall, who had charge of the patient, was favourable, there being no symptoms to lead to any special anxiety as to the result of the case. Two days later his mental condition for the first time excited attention and gave rise to apprehensions as to the final issue. His memory had begun to fail; he would begin a sentence, and forget what he had to say before he had completed it. This was followed by difficulty of articulation, and sopor, with muttering delirium. The pupil of the left eye was much contracted, and the urine passed involuntarily.

On the 28th, in the presence of the surgeon in charge, the wound was enlarged, and an extensive fracture of the cranium found, with an opening through which the finger could be passed into the brain. The patient was now placed upon absolute diet, and cold continuously applied to the head. Life was prolonged without much change until Nov. 3, ten days subsequent to admission, and fifteen days after the reception of the injury.

An examination of the head was made twelve hours after death, with the following results: There was a ragged wound of the left side of the scalp, communicating with a comminuted depressed fracture of the squamous portion of the left temporal bone, several osseous fragments having been forced into the brain-substance itself. The dura mater in the neighbourhood of the wound was disorganized and coated with a purulent and lymphy deposit. There was an abscess containing about an ounce of pus in the middle lobe of the left cerebral hemisphere, extending to, though not opening, the lateral ventricle of the same side. The brain throughout presented considerable interstitial congestion.

Remarks.—The question which is especially to be investigated in these histories is, whether any better result could have been anticipated, had their subjects been submitted to the use of the trephine.

The patient whose history is recorded in the first of the above cases presented evidences of cerebral irritation indeed for some time, but symptoms of compression, which are usually thought to demand operative interference, did not appear until the last day, and even then the patient could be temporarily aroused from unconsciousness; and yet the *post-mortem* appearances showed how impossible it would have been to save life by any interference at this time, while at no previous stage of the case were there any indications for a treatment different from that pursued; it being, in fact, believed that the ball had been removed, and had not really entered the cranial cavity.

The second case presents in a most satisfactory manner the favourable results to be hoped for from conservative treatment. The great danger attending the use of the trephine is probably owing to the admission of air to the contused and lacerated membranes and the brain, and it may be remarked in passing that those cases in which the injury itself has so

destroyed the skull-wall as to admit air freely, permit the removal of loose fragments and the use of the elevator, if it should be deemed necessary, without trephining, and furnish an ample opening for the escape of blood or the products of inflammation. If, now, as in the case under consideration, there be no communication between the cranial contents and the external air, there is reason to hope that the process of repair will be conducted to a certain extent as after subcutaneous injuries or operations; and that if exfoliation takes place, and sequestra must eventually be removed, it will not be until the meningeal surface has been converted into a healthy granulating tissue, and is thus enabled to bear the access of air without risk of injury. Thus, in Reed's case, owing to the impaction of the depressed fragments of bone, the wound, as far as the brain and its membranes were concerned, was practically a subcutaneous injury, and air was not admitted till after a month, when the broken fragments had become loose, and upon removal showed the dura mater covered with healthy granulations. Had an over-zealous surgeon, fearing compression and all its catalogue of dreaded consequences, hastily trephined this man upon discovering that he was the subject of a compound depressed fracture, I very much doubt whether the result would have been as gratifying as it proved under non-interference.[1]

The third case above recorded presents, like the first, one of those unfortunate instances where the autopsy shows only how useless any mode of treatment must have proved. The patient manifested no cerebral symptoms whatever until within eight days of his death, and yet the report of the autopsy shows that the membranes were disorganized, the brain throughout interstitially congested, with bony fragments deeply imbedded, and containing an abscess of considerable size. That these morbid changes could have

[1] In expressing the opinion that the access to the cranial contents of atmospheric air, and of the irritating particles with which it is habitually loaded, is fraught with danger in injuries of the head, I do not wish to be supposed to assert that the contact of air with *healthy* serous or synovial surfaces is attended with the evil consequences which were formerly attributed to it.

I am well aware that the pleura and peritoneum have been opened frequently without any bad results, and that free incisions into the joints are recognized as proper in certain conditions of joint wounds and injuries. But the point which I wish to bring out is, that the process of repair in wounds of serous as of other tissues will go on better without the access of the external air than with it; and a familiar instance is that of a fractured rib. The pleura is frequently wounded in simple fractures of the ribs, as shown by the presence of pneumothorax and emphysema, and yet such cases are not usually attended with much danger; for, although the pleural cavity may be distended with air, it is not with external or atmospheric air, loaded with dust, organic particles, or other impurities; but a compound fracture of the ribs, with the pleural cavity exposed, is an extremely serious injury.

So, again, a simple fracture through the condyles of the femur, involving the knee-joint, will commonly be recovered from without difficulty; but a compound fracture of the knee-joint will usually cost the patient his limb, if not his life.

been prevented by any operation, I confess appears to me in the highest degree improbable.

CASE IV. *Gunshot contusion of parietal bone; recovery.*—John Binder, private, Co. D, 114th Pa. Vols., 23 years of age, and by occupation a shoemaker, was wounded at the battle of Gettysburg, Pa., and entered the Cuyler Hospital, July 6, 1863. The early history of his case cannot be obtained, his condition preventing him from giving any satisfactory account of himself, and there having been no record kept by the medical officer who had charge of him when first admitted. When seen by Act'g Assist. Surg. R. N. Downs, U. S. A., from whose notes this report is compiled, he was found to have had a severe wound of the left side of the head, involving the loss of a portion of the parietal bone about the size of a silver dime. This fragment consisted of the external table of the bone merely, and presented evidence of having received a severe blow, being slightly indented. The pulsations of the cerebral mass were visible through the aperture in the skull, showing that the loss of substance had extended through the entire thickness of the bone; the inner table having probably come away in small pieces with the discharge.

At no time while this man was under observation were there any alarming constitutional symptoms, neither convulsions nor delirium being present, and the only abnormal mental phenomena being hebetude, loss of memory for recent events, and a reticence almost amounting to moroseness. The treatment consisted in perfect rest, low diet, the periodic administration of mercurial and saline purges, and at first small doses of tartarized antimony. The wound rapidly healed under simple dressing, and the constitutional symptoms diminished at the same time. This man was afterwards transferred to the second battalion, Veteran Reserve Corps, and served as an attendant in the ward.

CASE V. *Gunshot contusion of parietal bone; death from meningitis of the opposite side.*—Wm. Smith, private, Co. G, 4th N. Y. Heavy Artillery, 18 years of age, entered Cuyler Hospital, April 9, 1865. This soldier stated that he had been wounded in action, March 31, 1865, as he supposed by a conical ball. He had been treated at Emory Hospital, Washington, D. C, previous to his entrance into this hospital. His wound had not excited any particular attention, nor caused special alarm either to himself or to those who administered to his wants. When first seen in this hospital, he was found to have received a gunshot wound of the scalp in the left parietal region, penetrating to the bone, but not, so far as could be ascertained, accompanied by osseous lesion.

During the first week after admission the patient appeared to be progressing towards recovery, and it was not until the 16th, more than a fortnight from the date when his injury was received, that his condition began to excite any alarm.

At this time the patient had two or three slight convulsive paroxysms, lying in a somewhat soporose condition during the intervals. He afterwards became delirious, and finally almost completely comatose. The day preceding his death the muscles of the left side of the body (that of the wound) were observed to be in a state of spasmodic contraction. A large collection of pus formed beneath the left side of the scalp, anterior to the wound, and was opened the day preceding the final issue.

The pathological condition was supposed to be, that an abscess, resulting

from the original shock to the brain-substance, was exciting irritation, and would probably eventually burst into one of the lateral ventricles.

Mercurials, tartarized antimony, and the fluid extract of veratrum viride were exhibited internally, while the head was kept somewhat elevated and covered with cold fomentations.

Death ensued on the night of April 30, 1865, twenty-one days after the patient's entrance to this hospital, and just one month from the reception of his injury.

An autopsy was made about fourteen hours after death, with the following results: There was no fracture of the skull to be detected when the scalp was removed, and the bone was not bared beneath the abscess which has been described as having formed a few hours before death, but was manifestly necrosed just below the original wound.

On removing the skull-cap, it was found that a plate of bone about one inch long and three-quarters of an inch broad had been separated by exfoliation from the inner table, and was adherent to the dura mater immediately beneath the position of the original scalp wound. The brain was removed with the membranes entire, but a moderate quantity of blood and serum being found between the dura mater and the skull. On reflecting the dura mater of the *right* hemisphere, the arachnoid over the middle lobe of the cerebrum was found to be acutely inflamed, presenting an abundant deposit of soft coagulable lymph. The membranes of the left side presented merely a slight pearliness, and the adhesion of the dura mater to the sequestrum, already referred to.

The brain-substance on the right side was healthy; on the left side it was softened beneath the position of the wound, and at the depth of about three-quarters of an inch was a small abscess, not larger than a small hickory-nut. All other parts of the body examined appeared normal.

The muscular contraction on the same side of the body as the wound was now accounted for by the existence of intra-cranial disease upon the opposite side. Three important questions are suggested by the above history, viz:—

1. Why should a wound of one side of the head produce meningitis of the opposite side?

2. Had the patient not died of meningitis, might not the cerebral abscess have become encysted or absorbed, and life have been prolonged for perhaps several years?

3. Would not the skull eventually have exfoliated in its entire thickness, permitting the escape of *débris* externally, and allowing the wound to heal as in the preceding case?

Remarks.—The whole subject of contusion of bone has been recently so ably and fully discussed in this Journal, by Dr. Lidell, U. S. V., that it will not be necessary in this place to consider any point except that which forms the particular subject of the present inquiry, to wit, the applicability of trephining to cases such as those recorded above. And here it may be remarked that in cases of contused skull the brain and its membranes are even more liable to injury than where actual fracture has taken place, for in the latter the force of the blow is expended on the bone, and its more important contents may escape with comparative impunity. And hence the exposure of the cerebral mass to the atmospheric air is at least as

much to be dreaded in cases of contusion as in those of fracture. The only plausible argument in favour of trephining in such a case is to afford an exit to the products of inflammation or other effused materials, and here I think the last case reported is peculiarly in point, as illustrating the absolute uncertainty of any such result being accomplished by the operation. Death in this case resulted from meningitis upon the opposite side to that of the wound, and but for this complication (upon which trephining certainly could have produced no favourable effect), it would appear that the life of the patient might have been indefinitely prolonged, the small abscess in the left side of the brain being encysted, or absorbed and cretified, and the dead plate of bone above being thrown off by the natural process of exfoliation.

To sum up, then, the conclusions which I would draw as to the proper treatment of gunshot injuries of the head are as follows:—

I. In the large number of cases which die under conservative treatment, it does not appear from the autopsies that the use of the trephine could in any way have averted the fatal issue.

II. Many cases which, like those numbered II. and IV. in the above list, recover without trephining, would be seriously jeopardized by rashly admitting the atmosphere to the torn and bruised cranial contents, and thus placing them in the unfavourable circumstances of an open wound, instead of leaving them in the safer position of a subcutaneous, or, more strictly, "subosseous," injury.

III. In those cases which recover after the use of the trephine, the instrument does not deserve the credit of the cure; for if there be already an opening through the skull, the operation is unnecessary; and if there be not, it adds to the already serious injury a most dangerous complication.

IV. There is a close analogy, though often forgotten, between trephining and the resection of long bones. In compound fractures of the extremities we extract loose fragments, restore the others as nearly as possible to their proper places ("setting" the fracture), and then trust the case to nature. Just so, in compound fractures of the skull, it seems to me, we should content ourselves with removing the detached portions of bone, and restoring the rest, if possible, by the elevator or otherwise, to their proper level, and then withhold our hands; conducting the after-treatment upon physiological and rational principles. Trephining is the most serious and fatal of all resections; and I believe the day will yet come when it will be looked upon as a matter of curious and antique surgical history, rather than as an actual and established mode of surgical treatment.

225 S. SIXTH ST., PHILADELPHIA, August, 1865.

ART. IX.—*Ligation of Common Iliac Artery: Sequel of Case of Ligation of External Iliac Artery for Aneurism of the Femoral Artery.* By JAMES B. CUTTER, M. D., of Newark, New Jersey. (With a wood-cut.)

IN the July number of this Journal for the year 1864, I published the case of ligation of external iliac artery for femoral aneurism. At the time of publication this case was progressing favourably, with every indication of a speedy recovery, but, during the progress of the case subsequent to my report, unlooked-for symptoms were developed which had so important a bearing on its termination that the case would remain not only incomplete, but of no practical value without a full report to its termination. An accident occurred during the treatment of the case which we failed to note (not considering it of sufficient importance at the time), but which since proved of very serious import, and in consideration of this fact, with others of equal importance and interest, we take the liberty of presenting a *rēsumē* of the case with appended notes.

Geo. Clark, private, 4th New Jersey Regiment, a large muscular man, in vigorous health, whose avérage weight is two hundred pounds, accidentally wounded himself with the large blade of a pocket-knife in the inner side of the left thigh, about two inches below Poupart's ligament, the blade entering the femoral artery and vein, near the origin of the profunda.

His recovery was rapid, resuming his usual occupation (that of a farmer) in a week after the receipt of the injury. He never experienced any pain or difficulty after his recovery, except a pricking pain at the wounded point upon unusual or excessive walking, until August, 1863 (eight years after the receipt of the original wound), when, as the result of hardship and a long fatiguing march, his limb suddenly swelled so as to measure thirty-two inches in circumference. The patient was transferred in a few days after the swelling commenced to the Field General Hospital at Warrenton, Virginia, and while there suffered the most agonizing pain in the inner side of the thigh, directly over his former wound; this pain continued two or three days without intermission. From this hospital, he was sent to Washington, D. C., and thence to Newark, New Jersey, Hospital.

When admitted, the whole limb was greatly enlarged, with remarkable distension of cutaneous veins. While in the Newark Hospital, he was examined by a number of surgeons of eminence and position, none of whom had a suspicion of aneurism; some supposed there might be a tumour in the pelvis, making pressure upon the iliac vein. He never complained of pain in the region of the aneurism, except for three or four days at General Hospital, as above mentioned, and could never recall any circumstance that would be likely to give rise to such a condition of the limb.

The patient came under our observation some three months after his admission, and was made the subject of *special study*. He was repeatedly interrogated about his previous life and habits, about every accident that ever happened to him, no matter of how trivial a character it might seem to be; finally, after much labour, we recalled to his mind the accident that happened to him eight years before. After ascertaining this fact, our attention was directed to aneurism, and upon placing the ear upon the small scar so distinctly marked upon the thigh, we recognized the tumour to be aneurismal. 1st. By its peculiar thrill on firm pressure with the hand; and, 2d, by the aneurismal bruit so distinctly heard when the ear was applied to the thigh. After the diagnosis was made, the patient was examined by a number of surgeons, and the diagnosis of aneurism confirmed.

The operation for ligation of external iliac artery was performed on Saturday, February 6th, at a quarter of three P. M., assisted by Dr. J. F. Miner, of Brooklyn, N. Y. There were no complications in connection with the operations, except the superficial venous hemorrhage, which was *enormous*, and was remarked by a number of surgeons present as being the most abundant venous hemorrhage they ever saw. The characteristic feature of this venous hemorrhage was that it seemed to be confined almost exclusively to the integument, from the *entire* cut surface of which it flowed in a *continuous* and *copious* stream, retarded *slightly* (controlled it was not) by firm pressure.

The patient made a good recovery, the ligature coming away on the 25th day.

A day or two after the operation, a small spot of dry gangrene made its appearance upon the heel, notwithstanding considerable pains had been taken to prevent such an occurrence. It gave the patient no inconvenience whatever, excited no fear on our part, and being considered of such trivial importance, we failed to make note of it.

We will now continue our notes from last report (April 25, 1864). At that time the patient was moving about the wards, and expressing himself as "never having felt better in his life."

June 19. The whole limb for the last few days has been gradually increasing in size, the cutaneous veins that disappeared so soon after the operation are now becoming distended, the whole limb presenting the same appearance that it did previous to the operation. This morning, upon applying the ear to the thigh in the neighbourhood of the old cicatrice, the "aneurismal bruit" could be distinctly heard, the sound being communicated through the artery for some distance above and below the wounded point. As the dead mass upon the heel has nearly separated from the healthy tissue, we have removed it with forceps and scissors, and the sore dressed with simple cerate.

20*th*. Hospital gangrene having made its appearance in the hospital—for fear that he may be made a victim to its destroying influence—he has

been placed in a small ward by himself, and every precaution taken to prevent his exposure.

25th. Hospital gangrene has attacked the small sore upon the heel, and caused considerable destruction to the healthy tissue about. Tonics and stimulants are given freely. Bromine applied *pure* to the wounded surface after removing slough, followed by yeast poultices.

30th. Wound granulating nicely, patient otherwise doing well.

July 25. The whole limb has been steadily increasing in size, and is at present *enormously* distended. Gangrene has attacked the sore upon the heel again; destruction of tissue very extensive.

August 1. Patient doing well; reparative process going on rapidly. Tonics and stimulants have been given freely, and are continued.

24th. Patient has had still another attack of hospital gangrene in the heel, which has made a very extensive wound, opening the ankle-joint at one point, uncovering some of the bones of the foot. The os calcis protrudes from the wound some distance, and is mostly diseased.

These repeated attacks of gangrene reduced the patient's general strength, and had he not a *remarkably* vigorous constitution, we think he would have succumbed to these repeated attacks of this horrible and destructive disease.

Since the beginning of June, the foot, leg, and thigh have become *enormously* distended; the superficial veins are much enlarged, much more so than previous to the operation; the superficial circumflex iliac, superficial epigastric veins, and the superficial veins over the hip are *very much* distended.

The thigh measures thirty-seven inches in circumference at its largest point; the foot and leg measure in proportion. There are a number of openings upon the thigh which have lately put on a gangrenous appearance; the serum of the blood exudes through the openings to such an amount as to completely saturate his bed during the twenty-four hours that the patient remains upon it; the pain and inconvenience of being moved are so very great, that his wishes have been gratified in regard to having his wound dressed but once during the twenty-four hours.

During the last few days the patient has been examined by a number of surgeons from New York, Brooklyn, and this city, and all agree upon the propriety and justice of another operation, as the patient's suffering is *extreme*, and it is *his* wish, as well as that of his parents, that something be done for his immediate relief. The probabilities as to the result of the operation being made known to the patient, his *full* consent having been obtained to have it performed, Monday, September 17, is set apart as the day for the operation. Accordingly, preparations were made, and at 3 o'clock P. M. of the above date, in the presence of a number of medical gentlemen of New York and this city, and kindly and ably assisted by my former pre-

ceptor, Prof. Jo. C. Hutchison, of Brooklyn, N. Y., the patient was placed upon the operating table, and anæsthesia produced by a mixture of ether and chloroform, and the operation for the ligation of the common iliac artery commenced. An incision six inches in length was made just above the old incision made for the ligation of the external iliac artery; the abdominal muscles were carefully divided until the fascia transversalis was brought plainly into view; it was found firmly fastened to the peritoneum, which was very much thickened, and firmly adhered to the surrounding parts. It was found impossible to separate the peritoneum from the iliac fossa. The peritoneal sac was therefore opened, and the artery secured in that manner. The wound was brought together with silver sutures and adhesive plaster, and dressed as is usual with wound containing a ligature.

The superficial venous hemorrhage was enormous, but of a different character from the venous hemorrhage that took place during the course of the previous operation. The venous hemorrhage at this time was mostly confined to the three or four enlarged superficial veins, divided during the first and second strokes of the scalpel. With very little trouble these veins were secured, and the operation proceeded with.

September 18. Patient passed a pretty comfortable night; this morning has some tenderness over the abdomen, aggravated by wind in the intestines.

Condition of the Limb: Temperature not fallen any; great diminution in its size, having fallen away one-third. Warm application has been made to the foot only.

19*th*. Patient doing as well as could be expected; has still considerable tenderness over the abdomen; continue the pil. opii; limb still diminishing, is about one-half its former size.

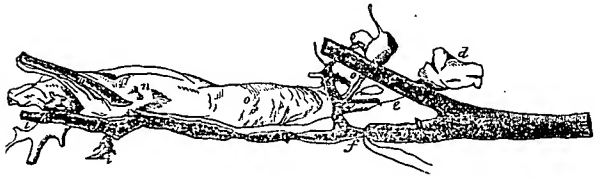
20*th*. Has regularly taken the pills of opium; is very much prostrated; breathing laboured; pulse 120; face flushed; expression anxious; severe headache; vomiting, which greatly aggravates his pain, has followed every attempt to take food.

21*st*. Patient appears to be sinking; pulse 140, quick and fluttering; respiration laborious and painful; skin cold and moist; abdominal tenderness great; abdomen greatly increased in size; bowels open this morning; stools free and feculent. Patient continued to sink through the day, and at 3 P. M. was relieved of his sufferings by death, having survived the operation five days.

Sectio cadaveris eighteen hours after death.—The whole surface of the peritoneum was coated with lymph, and there was a small collection of serum. The lymph in some places was in flakes; in other situations it was the consistency of thick gruel, closely resembling pus. No adhesion between the lips of the wounds.

The vessels were removed *en masse*, and after being prepared were sent

to the Army Medical Museum at Washington, D. C. This wood-cut represents the vessels as they are prepared, being taken from a photograph.



a. Abdominal aorta. *b.* Common iliac (left side). *c.* Common iliac (right side). *d.* Vena cava ascendens. *e.* Common iliac vein (left side) obstructed by inflammation. *f.* Point of ligation of common iliac. *g.* Point of ligation of external iliac, with sheath of vessels attached. *h.* Femoral artery. *i.* Profunda branch. *j.* Femoral artery, continued. *k.* Point of communication of artery and vein. *l.* Showing diminution in size of femoral artery below point of communication. *m.* Superficial external pudic artery enlarged. *n.* Enlarged femoral vein. *o.* Internal iliac vein occluded by inflammation. *p.* Internal iliac artery.

Note.—We still claim, so far as the ligation of the external iliac artery was concerned, a success, as given in the statistical table published with the first report of the case, inasmuch as the patient fully recovered from the effects of the operation.

NEWARK, N. J.

ART. X.—*Ligature of the Left Subclavian Artery.* By WILLIAM HENRY CHURCH, M. D., Surgeon to Bellevue Hospital. Communicated by HENRY G. PIFFARD, M. D., House Surgeon to Bellevue Hospital.

G. W., 31 years of age, a native of the United States, and by occupation a police officer, was admitted into Bellevue Hospital on the evening of the 3d of June, 1865.

About an hour previous to admission he had inflicted a gunshot wound upon himself in an attempt at suicide. The weapon was a small policeman's revolver, and the ball conical. The ball entered near the edge of the left pectoralis muscle six inches below the top of the shoulder, and passing through the axillary region emerged at a point opposite its entrance and about one and a half inch from the edge of the axilla. There was very slight hemorrhage from the wounds.

When first seen there was a large tumour in the region of the pectoralis major muscle due to the effusion of blood. The patient was unable to move the arm or hand of the injured side, and sensation in the forearm and hand was very much diminished, though not entirely lost. There was no pulsation in the radial or brachial arteries. The general condition of the patient was good, and he had not lost much blood, as evidenced by a normal pulse at the right wrist.

June 4. The condition good; no hemorrhage since admission; tumour at the upper part of the chest somewhat diminished. At a consultation